

Improver 4422

To improve UF adhesives gluing properties for different materials.

Improver 4422 is used together with urea formaldehyde adhesives, as an additive to improve the quality of the adhesion when gluing hard-to-glue wood species and/or HDF.

•	4422		
Product	Improver		
Delivery Form	Liquid		
Colour	White		
Viscosity	2000 - 10000 mPas	2000 - 10000 mPas	
(at time of production)	(Brookfield RVT, sp. 4, 20 rpm, 25°C	(Brookfield RVT, sp. 4, 20 rpm, 25°C / 77°F)	
рН	3,5 – 5,5	3,5 – 5,5	
at time of production)	(25°C / 77°F)		
Storage Life	20°C/68°F	30°C/86°F	
(months)	12	6	
	Recommended storage temp to 68°F	erature 15°C to 25°C / 59°F	
Storage Condition	Only short term exposure to temp below $\pm 0^{\circ}$ C / 32°F or above 35°C / 95°F is acceptable.		
Storage Condition	Frozen and thawed product cannot be used due to coagulation reactions in the product.		
	The product can form a skin on the surface if the container is not properly closed.		
Formaldehyde Info			
Density	Appr: 1070 kg/m ³		

Product Specification



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Gluing Operation Information		
Applications	Flooring	
Applications	Furniture	
Press Type	Hot press, High Frequency press	
	Improver 4422 can be added to the hardener or the glue.	
	The amount added should be evaluated in each specific case.	
Mixing ratio	When mixing; add the improver to adhesive or glue mix or hardener it may cause the improver to coagulate; thus creating lumps.	
	Contact Casco Adhesives representative before use.	
	For best result the wood must be smoothly planed.	
Preparation of wood	For optimum bond strength the bonding operation shall take place within 24 hours after preparation.	
Temperature of wood	In order to meet the given press times the temperature of the wood must not be below 20°C / 68°F.	

Machinery	
Applicator	Toothed trowel, brush, roller spreader, hand roller, manual glue spreader
Mixer	6201- Mixing system for UF, PRF, MUF
	6203- Mixing system for UF, PRF, MUF

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Handling	Always use aloves and goggles when handling the product
панини	Always use gloves and goggles when handling the product.
Cleaning	Use lukewarm water for glue on skin and machinery.
	Cleaning should start before the system dries.
Waste handling – of the products	Normally not to be considered as hazardous waste. Leave residues to dry before sending it off for disposal.
	For 2 component systems the hardener may be considered as hazardous waste, check the SDS (section 13).
	Improver mixed with glue and hardener – Can normally be treated as non hazardous waste when fully cured.
	NOTE! There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities.
Waste water treatment	Chemical precipitation \rightarrow drain*
 of the waste water 	Biological treatment \rightarrow drain*
	Mechanical precipitation \rightarrow drain*
	Incineration with wooden chips
	Please contact Environmental Advisor at the Environmental Department for further information regarding chemical precipitation.
	* municipal sewage with biological treatment
	NOTE! There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities.
Health and Safety	For more information see respective SDS.

For more information regarding the above mentioned data, see respective section below

Legal clause

The information is based on laboratory tests and practical experience. It is introductory and intended to help the user find the most suitable method of working. Since the user's production conditions are beyond our control, we cannot be held responsible for the results of the work which is affected by local circumstances. In each particular case testing and continuous control are recommended.



General information	in alphabetic order		
Accessories (Machine)	Examples of accessories includ control system for glue amount,	le glue chiller, day , and ratio of glue a	tank system, Ind hardener.
	For more information about acc Adhesives representative.	essories, please co	ontact your Casco
Applications	Examples of applications includ doors and windows, laminated upholstery, board on frame, and	le flooring, curved beams, assembly, d edge-glued pane	olywood, foliating, veneering, s.
	Our adhesives systems are dev applications.	eloped specifically	for different
	For more information, see the s Information."	ection, "Gluing Op	eration
Applicator	Examples of applicators include toothed trowel, and spray box.	e the roller spreade	r, ribbon spreader,
	Recommended applicators can	be found in the se	ction, "Machinery."
Approvals	Adhesives systems and/or final to official tests and certifications performed in accordance with s and EN. The "Approvals / Prod systems that have been approv	glued construction s. These tests and tandards such as <i>l</i> uct Specifications" ed by external inst	s may be subject certifications are ANSI, JAS, JIS, section lists glue itutes.
Assembly Time	Assembly time is measured from application of full pressure to the	m the application o e substrate.	f adhesive to the
	Assembly time is comprised of closed assembly time (CAT).	open assembly tim	e (OAT) plus
	OAT is measured from the appl assembly.	ication of adhesive	to substrate
	CAT is measured from substrat pressure.	e assembly to the	application of full
	The OAT and the CAT are influ moisture content in the wood, a humidity. Higher glue spread, lo moisture content in the wood ar the OAT and CAT.	enced by the glue and the ambient ten ower temperature, and in the surrounding	spread, the nperature and and higher ng air will extend
	The OAT and CAT data should assembly time (OAT + CAT) mu case.	be regarded separ ust be evaluated in	ately. The total each specific
Cleaning	Equipment must be cleaned with tepid water before the glue has cured. Cured / dried adhesive must be removed mechanically.		
Formaldehyde emission information	Casco Adhesives' PVAc system levels of formaldehyde, and mo requirements (if glued on an "F	ns contain no levels st fulfil the JAS/JIS ****-board).	s or extremely low 5 F****
	For more information about em nearest Casco Adhesives repre	issions norms, plea sentative.	ise contact your
Glue line properties	Examples of glue line properties	s include durability	water and heat
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	resistance, cold creep, and colour.
	Glue line properties may also be classified according to norms and standards. The "Approvals / Product Specification" section lists glue systems approved by an external institute.
Glue spread	Glue spread is chosen according to application, type of glue system and type of substrate.
	A slight squeeze out of adhesive along the edge of all the joints when pressure is applied indicates adequate spread and that the total assembly time has not been exceeded.
	Excessive squeeze out indicates excessive glue spread, excessive pressure, or a combination of these two factors.
	Higher glue spread can be used when long assembly times are required.
	An evenly applied glue spread is important. To achieve an evenly applied spread, use a good quality applicator and keep it maintained.
	The optimal glue spread must be determined for each specific case. The "Glue spread / Gluing Operation Information" section provides a guideline.
Health and Safety	Study the Safety Data Sheet before using Casco Adhesives products.
	See also Handling.
Machine Time	See Pot Life.
Miscibility	Whether a product can be mixed with another product must be determined in each specific case. Please contact your nearest Casco Adhesives representative for more information.
Mixer	Mixers are used for the automatic mixing of adhesive and hardener or for multi-component mixing.
	The mixer best suited for this system is listed in the "Machinery" section.
Mixing ratio	The adhesive and hardener should be mixed in the ratio provided in the section, "Gluing Operation Information." If other mixing ratios are used, various factors including press times, pot lives, assembly times, and glue line quality will be affected.
	Ensure that the adhesive and hardener have been thoroughly mixed before the mixture is used.
	If mixing the hardener and adhesive by hand, add the hardener to the adhesive.
Moisture content	The moisture content of the wood will affect the gluing result. High moisture content can slow the system, and for some adhesive systems, excessively high moisture content will destroy the glue line quality.
	In some cases, excessively low moisture content can accelerate the gluing process.
	The moisture content of the wood will also affect the overall quality of
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	the end product. Moisture content that is uneven, excessively low, or excessively high can cause the material to warp, cup and become uneven.
	The recommended moisture content for this system is listed in the section, "Gluing Operation Information."
рН	The "Product Specification" section lists the pH and whether that pH is measured at the time of production or the time of delivery. The pH may change over time. As long as the product is used within given storage time and stored under the recommended conditions, a small change in pH will not affect the gluing operation or quality.
Preparation of wood	For best bonding results, the surface of the substrate must be adequately prepared. For optimum bond strength, the bonding operation shall take place within 24 hours after preparation.
	The surface must also be free from dust, grease, oil, and other contaminants.
	The substrate must be carefully selected so as to achieve optimum bond line quality.
Post curing	Post curing is the time needed for the bond line to build enough strength to withstand construction.
	The specific post curing time required to reach full strength is dependent on the pressing time, the pressing temperature, and the post curing temperature.
	Curing at temperatures other than the temperatures designated in the "Gluing Operation Information" section will change the required post curing time. The adjusted post curing time must be provided by a Casco Adhesives technical advisor.
	For more information about post curing, see the "Post Curing Time / Gluing Operation Information" section.
Pot Life	Pot life is defined as the period of time during which the mixture of glue and hardener can be used. Casco Adhesives measures pot lives using controlled methods of analyses, so the pot lives of different systems can be compared.
	The so called "machine time" is related to the pot life of a system. The machine time depends largely on the roller speed, the glue mix temperature, humidity, ambient temperature, and the turnover of glue. Because of the different processes used, and because conditions vary from process to process, it is very difficult to indicate the machine time for a specific system. The pot life can be used to provide a guideline for the machine time.
	The pot life and machine time can be prolonged by using Casco Adhesives Glue Chiller. Lower temperatures translate to a longer pot life and machine time.
Press Time	Press time is the interval of time a bonded joint should be kept under pressure before handling. Casco Adhesives measures press times using controlled methods of analyses, so the press times of different systems can be compared.
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	The distance provided measures from the innermost glue line to the press plate. The given press times are related to a material temperature of approximately 20°C / 68°F. If the temperature of the material is lower, the pressing time must be prolonged.
	The press times in the "Gluing Operation Information" section should only be used as a guideline; press times for different processes must be determined in each specific case. Numerous parameters influence the performance of the glue system, such as the condition of the press, the moisture content of the substrate, the type of construction, and the species of wood.
Press Temperature	The press times in the "Gluing Operation Information" section correspond to hot press, where the press temperature is defined as the temperature of the press plate. However, the generation of heat in the actual glue line depends on the press technology being used (see Press Type).
	Some adhesive systems may require special glue line temperature intervals. The press temperatures best suited for this system is listed in the section, "Gluing Operation Information."
Press Type	The many types of available press technologies include cold press, heated press, clamp carrier, and Radio Frequency. The press type that best suited for this system is listed in the "Gluing Operation Information" section.
Pressure	This is the pressure holding the substrates together while in the glue line during the press operation, until the bond is strong enough to sustain the construction.
	Superfluous pressure may cause excessive squeeze out, resulting in a starved glue line.
	Inadequate pressure may result in poor contact between the two surfaces, causing a weak bond.
	General recommended pressure for wood gluing is 0,3-1,0 MPa. More exact pressure levels for different processes must be determined in each specific case in order to obtain optimal bond strength.
Storage Condition	In order to achieve the given storage life for the product, it is very important that the product is stored under the recommended conditions.
	The optimal storage conditions for this system can be found in the "Product Specification" section.
	See also Storage Life.
Storage Life (Shelf Life)	The storage life for a product is determined by parameters such as reactivity, viscosity and rheology. The storage time ends when the reactivity, viscosity or rheology transforms from a relatively stable value to a value that can affect the gluing quality.
	An excessively high temperature will accelerate certain chemical and physical phenomena in some products and shorten the storage life. An excessively low temperature may cause irreversible reactions

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	during freezing, such as gel and lump formation.
	Humidity may also play an important role for the storage of products such as powder products, PUR, and hardeners for EPI.
	If the packaging is left open for long periods, the glue is susceptible to skin formation on the surface. To avoid skin formation, keep the packaging closed when not in use.
	If the viscosity has increased but the reactivity is still sufficient, the storage life of some products can be prolonged if the product can be stirred before usage. Emulsion-based products can normally be used as long as they have not separated or thickened, and show no signs of bacterial degradation (bad smell and low viscosity). Separation is evident as a visible layer of water on top of the adhesive. These descriptions are guidelines and they do not comply with all products. Always contact your nearest Casco Adhesives representative for assistance and recommendations.
	The storage life and conditions are listed in the section, "Product Specification."
Temperature of wood	If a glue system is used for cold pressing* or pressing at low temperatures, the temperature of the wood has a significant impact on the pressing time. For example, when the incoming wood has a temperature of 10°C / 50°F, the press time is substantially longer than when the wood has a temperature of 20°C / 68°F.
	The temperature of the wood has greater impact when pressing at low temperatures than when pressing at temperatures above approximately 50°C / 122°F. However, pressing times will be affected even at higher pressing temperatures during colder seasons, when the temperature of the wood can drop to close to 0°C / 32°F.
	In order to achieve the given press times, the temperature of the wood must not fall below the minimum temperature listed in the "Temperature of wood / Gluing Operation Information" section.
	*cold press is defined as the absence of an external heating source like a hot press or radio frequency.
Viscosity	Viscosity is defined as the resistance to the flow of a liquid. The "Product Specification" section lists the viscosity and specifies whether the value is measured at time of production or at time of delivery. The viscosity may change over time. As long as the product used within the given storage time and stored under the recommended conditions, a small change in viscosity will affect neither the gluing operation nor quality.
	Viscosity is very temperature dependent; high temperature normally results in a low viscosity, and low temperature normally results in a high viscosity. In order to ensure an even viscosity of the adhesive components, the use of Casco Adhesives Glue Chiller is recommended.
Waste handling	Normally not to be considered as hazardous waste. Leave residues
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 of the products 	to dry before sending it off for disposal.
	For 2 component systems the hardener may be considered as hazardous waste, check the SDS (section 13).
	NOTE! There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities. If assistance is needed, contact Casco Adhesives Environmental Advisors.
Waste water treatment - of the waste water	Chemical precipitation \rightarrow municipal sewage with biological treatment
	Chemical precipitation* will decrease the amount of glue residuals in glue waste water.
	The chemicals act as flocculants, thus clustering the glue particles together, making them to sediment.
	After treatment, the waste water has a lower dry content, which prevents the waste water from clogging pipes and drains.
	The obtained sediment, when dried, can be disposed of as non- hazardous industrial waste.
	Collecting waste water
	An easy way to collect glue waste water is to use empty glue barrels. It is appropriate to have two or more barrels for this purpose, depending on the amount of waste water and the time it takes for the sediment to form after precipitation.
	Handling of treated waste water
	The treated waste water can normally <u>not</u> be let out directly into the drains without permission from the local authorities. If needed, contact Casco Adhesives Environmental Advisors for assistance in communicating with local authorities.
	Handling of sediment
	When a barrel is full of sediment, let it stand until the sediment has dried, preferably in high temperature (above 50°C / 122°F). The barrels with the dry sediment can thereafter be disposed of as non-hazardous industrial waste. Contact local authorities for directions on how to dispose.
	* Casco Adhesives can not provide precipitation chemicals for PVAc, please contact Environmental Advisor at the Environmental Department for further information.
	NOTE! There might be national and/or local regulatory differences, therefore always keep a dialogue with the local authorities. If assistance is needed, contact Casco Adhesives Environmental Advisors.

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